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TRANSMITTAL FORM (to be used for all correspondence after initial filing)		
	Application Number	10/014,392
	Filing date	October 22, 2001
	First Named Inventor	Johannes Verboom
	Art Unit	2133
	Examiner Name	Joseph D. Torres
Total Number of Pages in This Submission	Attorney Docket Number	18504-333

ENCLOSURES *(Check all that apply)*

- ☒ Fee Transmittal Form
  - ☐ Fee attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
- ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Copy of the PTO Form 1533 (Rev. 9/97), Notice to File Missing Parts of Application *Filing Date Granted*
- ☐ Executed Declaration and Power of Attorney Document
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) ________________
- ☐ After Allowance Communication to a Technology Center (TC)
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal (2 copies) (Appeal Notice, Brief, Reply Brief)
- ☐ Proprietary Information
- ☐ Status Letter
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Remarks:

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	Craig J. Lervick
Signature	Craig J. Lervick
Date	August 15, 2005

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313 on this date: August 15, 2005

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Signature	Janet Byrne	Date:	August 15, 2005

FEE TRANSMITTAL for FY 2005

Patent fees are subject to annual revision.

☐ Applicant Claims Small Entity

TOTAL AMOUNT OF PAYMENT	$250.00

Complete if Known	
Application Number	10/014,392
Filing Date	October 22, 2001
First Named Inventor	Johannes Verboom
Examiner Name	Joseph D. Torres
Group Art Unit	2133
Attorney Docket No.:	18504-333

METHOD OF PAYMENT

1. X Authorized to charge indicated fees or credit

Deposit Acct No.: **50-1901**
Name: **Oppenheimer Wolff & Donnelly LLP**

X Charge Any Add'l Fee Required Under 37 CFR 1.16 and 1.17

2. ____ **Payment Enclosed:** Check __Credit

FEE CALCULATION

1. BASIC FILING FEE

Large Fee	Small Fee	Fee description	Fee Paid
1000*	500*	Utility filing fee	
430*	215*	Design filing fee	
660*	330*	Plant filing fee	
1400*	700*	Reissue filing fee	
200	100	Provisional filing fee	
		SUBTOTAL (1)	$0.00

2. EXTRA CLAIM FEES

		Extra Claims	Fee	Fee Paid
Claims	- 20 =		50/25	
Ind. Claims	- 3 =		200/100	
Multiple Dependent			360/180	

Large Entity Fee ($)	Small Entity Fee ($)	Fee Description
50	25	Claims in excess of 20
200	100	Independent claims in excess of 3
360	180	Multiple dependent claim
200	100	** Reissue independent claims over original patent
50	25	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) $0.00

3. Application Size Fee (Utility)

If the specification and drawings exceed 100 shts of paper, the application fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s)

SUBTOTAL (3) $0.00

FEE CALCULATION (continued)

4. ADDITIONAL FEES

Fee Code	Large Entity Fee ($)	Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	Filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1840*	Requesting publication of SIR after Examiner action	
1251	120	2251	60	Extension for reply within first month	
1252	450	2252	225	Extension for reply within second month	
1253	1020	2253	510	Extension for reply within third month	
1254	1,590	2254	795	Extension for reply within fourth month	
1255	2,160	2255	1,080	Extension for reply within fifth month	
1401	500	2401	250	Notice of Appeal	
1402	500	2402	250	Filing a brief in support of an appeal	$250.00
1403	1,000	2403	500	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	500	2452	250	Petition to revive - unavoidable	
1453	1,500	2453	750	Petition to revive - unintentional	
1501	1,400	2501	700	Utility issue fee (or reissue)	
1502	800	2502	400	Design issue fee	
1503	1,100	2503	550	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	130	1807	130	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	790	2809	395	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	790	2810	395	For each additional invention to be examined (37 CFR 1.129(b))	
1801	790	2801	395	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	
				Other fee (specify)	
				SUBTOTAL (4)	$250.00

SUBMITTED BY			*Complete (if applicable)*
Name	Craig J. Lervick	Registration No.: 35,244	Telephone: 612-607-7387
Signature	Craig J Lervick	Date:	August 15, 2005

*Includes: Filing fee + Examination fee + Search fee

** Total Sheets -100 = Extra Sheets /50 = (No. of ea. Additional 50 or fraction thereof) x Fee

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Johannes Verboom	
Serial No.:	10/014,392	
Filing Date:	October 22, 2001	**Group Art Unit:** 2133
Title:	OPTIMIZED DATA STORAGE SYSTEM AND METHOD FOR OPTICAL STORAGE SYSTEM	**Examiner:** Joseph D. Torres
Docket No:	18504-333	

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail with sufficient postage and is addressed to Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 15, 2005. (37.CFR 1.8a)

Janet Byrne

Janet Byrne

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANT'S APPEAL BRIEF

Dear Sir:

In response to the Office communications dated March 15, 2005; Appellant appeals the rejections of Examiner Joseph D. Torres.

(1) REAL PARTY IN INTEREST

The present application was originally assigned to Plasmon LMS, Inc.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences related to the present case.

(3) STATUS OF CLAIMS

Claims 1-31 are pending and are herein appealed.

(4) STATUS OF AMENDMENTS

Prior to the final rejection, an amendment was filed on January 31, 2005 in which claims 1, 10, 12-15 and 17-22 were amended. Additionally, further amendments were made to the specification, all of which have now been accepted by the examiner.

Subsequent to the final rejection, an amendment was filed on May 16, 2005 in which claims 1, 13, and 22 were amended. These amendments were not entered.

(5) SUMMARY OF CLAIMED SUBJECT MATTER

The present invention provides a data storage system which comprehensively controls data storage and retrieval operations to provide optimized operations while also minimizing a number of error sources. The invention achieves optimized operation by storing information on the media which includes a number of periodically placed reference bytes which are integrated with the data itself. These reference bytes or reference fields are in addition to existing synchronization and timing bytes that are typically included at the beginning of a data sector. Including these periodic reference bytes provides several advantages, such as the ability to continually update and/or adjust its phase control and gain control as needed. Furthermore, the reference bytes easily provide additional error correction information for the data storage system.

Independent claims 1, 13 and 22 each provide a method for operating a data storage system wherein reference fields are first interleaved with data being stored to the media. These interleaved reference fields are positioned within the data, so that further analysis and examination of the data signal can be accomplished (claims 1 and 13 specifically state that these reference fields are placed at predetermined locations). Upon reading the interleaved data, the reference fields are analyzed and compared against expected readout conditions. More specifically, the reference fields include predefined patterns, thus an expected readout signal can be anticipated. Based upon this analysis, readout errors can potentially be identified and adjustments to operating parameters can be made.

As further outlined in various dependent claims, the operating parameters which can easily be adjusted include gain control and phase synchronization. Additionally, error correction is implemented utilizing the same reference field.

As previously mentioned, each reference field includes a defined data pattern which is periodically interleaved with data in the data field. The signal retrieved from the reference byte can be analyzed for both amplitude and shape. Based on this analysis, a reference status byte can easily be created which quickly and simply indicates whether the read-out system is accurately reading the data. In one embodiment, the reference status byte includes a single bit to indicate the shape status (e.g., expected shape v. unexpected shape), a single bit to indicate the amplitude status (e.g., expected amplitude v. unexpected amplitude), and the remaining bits to indicate amplitude value. Consequently, meaningful information will be produced throughout its read process, indicating the operational status of the read-out system.

In addition, this reference status byte can then be used in conjunction with other ECC methodologies to further enhance the accuracy of data read from the storage system. For example, data correction systems which organize data in a matrix format and perform more involved data correction operations can utilize the data format described above, however, they must simply account for the presence of periodic reference bytes.

(6) <u>GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL</u>

(a) Claims 1, 3, 10, 13, 14, 16, 17, 19, 20, 22, 23, 26 and 31 were rejected under 35 U.S.C. 102(b) as being anticipated by *Kuroda et al.,* U.S. Patent No. 5,875,163 A. In making this rejection, has the Examiner established a *prima facie* case of anticipation by illustrating the presence of each claim element?

(b) Claims 2, 9, 11, 12, 15 and 27-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kuroda et al.,* U.S. Patent No. 5,875,163 A. In making this rejection, has the Examiner established a *prima facie* case of obviousness?

(c) Claims 4-8, 18, 21, 24 and 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Kuroda et al.,* U.S. Patent No. 5,875,163 in view of *Verboom et al.,* U.S. Patent No. 5,574,706. In making this multi-reference rejection, has the Examiner established a *prima facie* case for obviousness?

(7) ARGUMENT

In rejecting the pending claims, the Examiner has utilized an inappropriate reading of *Kuroda* et al., U.S. Patent No. 5,875,163 (hereinafter "*Kuroda*"). Consequently, the pending rejections under 35 U.S.C. §§ 102 and 103 are not justified. In summary, *Kuroda* does not provide sufficient teaching to anticipate claims 1, 3, 10, 13, 14, 16, 17, 19, 20, 22, 23, 26 and 31. Further, the teaching of *Kuroda* is not sufficient to render obvious claims 2,9,11,12,15 and 27-30. Lastly, the combination of *Kuroda* and *Verboom et al.* (hereinafter "*Verboom*") is not proper and when combined does not render claims 4-8, 18, 24 and 25 obvious. In light of these deficiencies, Appellant requests that the Examiner's conclusions be overturned and the claims be allowed.

A. *Background*

Appellant filed the original application on October 22, 2001. Initially, the application included claims 1-31.

On August 12, 2004, Appellant's Representative received a telephone call from Examiner Torres regarding an election requirement. During that telephone interview, claims 22-31 were provisionally elected with traverse.

In an Office Action mailed on August 24, 2004, all pending claims were rejected, and additional objections were made to the specification and drawings. More specifically, claims 1, 3, 10, 13, 14, 16, 17, 19, 20, 22, 23, 26 and 31 were rejected under 35 U.S.C. § 102(b) as anticipated by *Kuroda.* Additionally, claims 2, 9, 11, 12, 15 and 27-30 were rejected under 35 U.S.C. § 103(a) as unpatentable over *Kurodal.* Lastly, claims 4-8, 18, 21, 24 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kuroda*, in light of *Verboom et al.* (U.S. 5,574,706 A).

On January 31, 2005, Appellant submitted an Amendment and Response which amended the abstract, specification, and selected claims. In this filing, Appellant presented detailed arguments regarding the allowability of the claims, as amended.

On March 15, 2005, Examiner Torres mailed a final Office Action, again rejecting claims 1-31. In this Office Action, the drawings were deemed acceptable and the objections to the specification were withdrawn. With regards to the claims, the Examiner maintained the same rejections as set forth in the previous Office Action.

On May 16, 2005, the Appellant submitted an Amendment and Response to the Final Office Action, proposing additional claim amendments.

On June 1, 2005, Examiner Torres mailed an Advisory Action indicating that the amended claims did not place the application in condition for allowance as they raised new issues that would require further consideration and/or search. For purpose of appeal, these amendments were not entered.

On June 15, 1005, Appellants filed a Notice of Appeal, to which this Appeal Brief is related.

B. *The Claimed Invention*

Simply stated, the Appellant has discovered that storage system performance and operation is greatly improved by interleaving reference patterns with the data when it is written to the storage media. This interleaved data set is then written to the data storage sections of the media – that area between headers or synchronization structures previously placed on the media. Once written, the media will contain a number of written marks and spaces in the data storage areas, as is typical for any storage system. The difference however, is that reference patterns are periodically placed in the data fields at user defined locations, which allows for periodic verification of various operating parameters. These reference patterns are easily implemented since they are interleaved with the data prior to being written to the media. The reference marks are thus handled the same as data when writing to the media surface. (Incidentally, these reference marks could easily be used in conjunction with physical marks previously placed on the media surface.)

Again, the raw data to be stored on the media surface is interleaved with reference data in a user directed, predetermined format. This interleaving step is undertaken either prior to the writing of any information on the media surface, or concurrently therewith. Thus, the step of "storing" includes writing both data and reference fields to the media, and allows the user to control the details of this implementation. By having the reference data included, the readout system is then able to periodically check the operation of the data storage system – either data retrieval or data storage itself. These periodic checks can happen at relatively short intervals because they are interleaved within the data. Further, this compliments the existing synchronization structures present on the media (i.e., headers formatted on the media). By

configuring this reference data in an appropriate manner, several different optimization functions are achieved, including gain and phase settings for the readout system, along with error correction methodologies. Further, by allowing the user to control the placement of reference data, these updates can be optimized for the particular system.

As outlined below, the various features of the claimed invention are not taught or suggested by the cited prior art. As such, the pending rejections should be reversed and all claims should be allowed.

C. *Kuroda Does Not Anticipate the Claimed Invention.*

Claims 1, 3, 10, 13, 14, 16, 17, 19, 20, 22, 23, 26 and 31 have been rejected under 35 U.S.C. §102(b) as anticipated by *Kuroda*. Examining *Kuroda* in detail however, reveals that this reference does not disclose the claimed invention. Most significantly, *Kuroda* does not teach the interleaving of reference fields with data to achieve a data/reference field structure that can be periodically examined to address operational concerns. *Richardson v. Suzuki Motor Co.* clearly requires that a reference in a 35 U.S.C. § 102 rejection show the "identical invention...<u>in as complete detail</u> as is contained in the...claim". 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed.Cir.1990). *Kuroda* does not show the claimed invention, and thus does not justify the rejection under 35 U.S.C. §102(b).

The background of *Kuroda* is definite indicator regarding its actual teaching. Simply stated, this reference is directed toward a rotation control apparatus for controlling a spindle motor within a drive system. *See, Kuroda, Col. 1, ln. 8-10.* Rotation control is achieved by coordinating various structures on the surface of the media, specifically grooves, tracks, and related pre-pits. The pre-pits form pre-information on the disk which is used within a sync frame. These structures are formed by the media manufacturer prior to delivery or use in a data storage system. *Id., col. 5, lines 18-21.*

Kuroda further outlines how "the pre-information is recorded by forming pre-pits onto the land tracks by using a cutting apparatus, for example." *Id., col. 5, lines 5-7.* "Pre-pits 4 corresponding to the pre-information are formed on the land tracks 3 by the cutting apparatus or the like. The pre-pits 4 are previously formed before shipping of the DVD-R1." *Id., col. 5, lines 18-21.* When discussing actual operation, *Kuroda* goes on to state that "the pre-information is detected from the pre-pit 4 prior to recording of information by a tangential push-pull method,

which will be explained hereinafter." *Id., col. 5, lines 42-44.* Further reading of *Kuroda* clearly outlines how all pre-information is stored on media by forming pre-pits. *See, e.g. col. 6, lines 16-21* (outlining how variations in the pre-information pattern are required due to problems when pre-pits are concentrated in one area.); *col. 7, lines 35-42* (outlining how a laser diode and photo-detector are utilized to retrieve pre-information which has been recorded by forming the pre-pits); *col. 7, lines 42-45* (general discussion regarding the use of pre-pit signal reproducing circuit 11 for reproducing pre-information). The focus on pre-pits is further illustrated when the figures of *Kuroda* are examined, which only show pre-pit detection schemes and circuitry. See, *Id., Figs. 4, 5, and 11.*

Most significantly, however, *Kuroda* does not include any suggestion of reference data interleaved with data to be stored, as specified in the claimed invention. The *Kuroda* storage system is limited to the physical structure located on the surface of the media. This clearly would be expected for a system that is concerned with rotation control. While being similar to most media systems utilizing pre-pit addressing and synchronization techniques, the scheme is very different from the claimed invention.

The Examiner has apparently concluded that the overall structure of *Kuroda*, after data is written, forms in an interleaved pattern. However, this pattern is clearly achieved by first creating the physical structure upon the disk surface, which has pre-information formed by pre-pits. Subsequently, data is simply written to the areas between these pre-pits (i.e., the data storage areas of the disk). This issue of timing is significant as the pre-pit structure clearly provides limitations and shortcomings that the present invention was specifically designed to overcome. This feature is apparently being overlooked by the Examiner.

Further, the Examiner has stated that "pre-pit information" is not "pre-information." Appellant asserts that this is incorrect. All information discussed in *Kuroda* is created by pre-pits. These pre-pits can form different types of information, such as sync information, but all are represented by performed pits on the media surface. See, *e.g., Kuroda, col. 3, lines 5-6 and 34-35 (sync pits are part of the pre-pits).* Further, *Kuroda* specifically states that pre-information corresponds to pre-pits formed on the land tracks of the media. *Id., col. 5, lines 18-21.*

In light of the above-discussed shortcomings in *Kuroda* et al., the Examiner has not established a *prima facie* case of anticipation. The cited reference simply does not teach all elements of the claim.

D. *Kuroda Does Not Render the Claimed Invention Obvious.*

Examiner Torres has rejected various dependent claims under U.S.C. § 103(a) based on *Kuroda*. Each of the rejected claims in this section, are dependent claims. Consequently, all arguments applicable to the independent claims, as outlined above, are equally applicable here. For this reason alone, all obviousness rejections should be removed.

1. *Kuroda* Alone Does Not Render the Claims Obvious.

As outlined above, the Examiner has rejected claims 2, 9, 11, 12, 15 and 27-30 under 35 U.S.C. § 103(a) as being unpatentable over *Kuroda* et al. Again, however, reviewing *Kuroda* et al. in detail reveals that this reference lacks sufficient teaching to render obvious the above-listed claims.

To establish a *prima facie* case of obviousness, an examiner must demonstrate that all claim limitations are taught or suggested by the prior art. *See* MPEP § 2143.03. "All words in a claim must be considered in judging the patentability of [the claim] against the prior art." *Id.* (citing *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970)). Generally speaking, each of the rejected claims under this section includes limitations related to a reference status byte which is created during the analysis step. More specifically, the status byte will include amplitude and/or shape information, indicating whether or not the reference field contains the expected signals. In the present invention, this status byte allows for the rapid "on the fly" analysis of the reference fields.

Simply stated, there is nothing in *Kuroda* to suggest this concept. With regard to amplitude and phase bits, *Kuroda* at best teaches phase analysis, however, does not consider signal amplitudes. Consequently, it does not produce any type of amplitude bit indicating an amplitude condition. When combined with other elements of the claims, there is nothing in *Kuroda* et al. to suggest this claimed invention is obvious. *Kuroda* simply does not provide sufficient teaching to establish a *prima facie* case of obviousness.

2. *Kuroda* in view of *Verboom* does not establish obviousness.

Claims 4-8, 18, 21, 24 and 25 have been rejected as unpatentable over *Kuroda* in view of *Verboom*. More specifically, the Examiner contends that one skilled would have recognized that these claims to be obvious in light of the teachings contained in *Kuroda* and *Verboom*.

Establishment of *prima facie* obviousness requires that references when read in combination must teach or suggest all the claim limitations. MPEP § 2142 at ¶ 3. "The mere fact that references can be combined or modified is not sufficient to establish prima facie obviousness . . . unless the prior art also suggests the desirability of the combination." MPEP § 2143.01 at ¶ 9.

The particular claims rejected under the combination of *Kuroda* and *Verboom* relate to the specific operational characteristics being monitored and updated by the method of the present invention. More specifically, these claims relate to optimization of the read signal offset, read signal gain, phase synchronization, and resolution of the readout window.

For references to be properly combinable, a motivation must exist for the combination. Most often, this requires some reason for one skilled in the art to combine the various references. See, MPEP § 2143.01 at ¶ 9. In this case, the teachings of *Kuroda* and *Verboom* do not themselves provide any motivation for their combination. Further, the combination does not result in the claimed invention. *Verboom* is related to focus offset adjustments utilizing a servo field. While this does relate to the general field of the present invention, it specifically teaches away by discussing the specific use of servo fields contained in a header. More importantly, any references or utilized bits are not interleaved with data. For this reason alone, these references are not appropriate to support this rejection and the claims should also be allowed.

In the Final Office Action, the Examiner does, at least partially, respond to the arguments outlined above. The Examiner contends that *Kuroda*, in defining sync frames with pre-information within a recording sector, has already addressed the idea of interleaving sync data within a data recording sector. But, the Examiner fails to address the differences between *Kuroda* invention and the current invention. *Kuroda* writes the sync frame information to the disk at the manufacturer, giving the end user no control over how the sync data is distributed across the media. The current invention eliminates the limitation that the sync data is recorded during manufacture. This permits the end user to configure how frequently sync points are employed, with greater number of sync points allowing for a greater degree of accuracy in identifying read errors and smaller numbers allowing for more data to be read from the media in a shorter time. In effect, synchronization and error checking becomes user configurable and not defined by the media manufacturer.

Furthermore, the examiner is overlooking the benefits in using the sync points during the writing process. Because the current invention writes the sync points concurrently with the user data, the sync points will suffer from the same degradations in performance that the user data might suffer from. This allows the invention to catch and respond to writing errors more quickly than the device described in *Kuroda* et al. could respond.

CONCLUSION

The interleaving of reference data, as contemplated by the present invention, goes beyond the pre-pit methodology of *Kuroda*, and provides unique and valuable features not contemplated. Further, the interleaving techniques of the present invention provide flexibility for the data storage system. For example, the reference fields could be placed at any selected distance from one another in order to provide tailored updates needed for a storage system. In certain instances, it is beneficial to provide this reference data at a more frequent rate, thus providing more frequent updates. Alternatively, a storage system may utilize fewer occurrences of the reference data, thus maximizing data storage capacity and reducing overhead. Clearly, this is a much different methodology and scheme than those utilized by systems relying solely on pre-pit information provided on the media surface.

Appellant submits that for at least the reasons stated above all pending claims are allowable over the art of record. Appellant respectfully asserts that the Examiner has not established a *prima facie* case of anticipation or obviousness, as demonstrated above, and requests that the Board of Patent Appeals and Interferences reverse the Examiner's decision.

If any fees are due in connection with the filing of this paper, then the Commissioner is authorized to charge such fees including fees for any extension of time, to Deposit Account No. 50-1901 (Docket 18504/333).

Respectfully submitted,

By ____________________

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Attachment: Appendix (Claims Subject to Appeal)

Claims Subject to Appeal

1. (Previously presented) A method of storing data on a storage medium having data storage areas and retrieving the stored data which includes the ability to predict readout errors when the stored data is retrieved, comprising:

interleaving the data with a plurality of reference fields, each reference field including a defined data pattern;

storing the interleaved data within the data storage areas such that the reference fields are at predetermined locations;

upon demand, retrieving the interleaved data;

analyzing the retrieved interleaved data by testing the retrieved reference field to determine if the retrieved reference field meets a predetermined shape condition and a predetermined amplitude condition; and

determining whether readout errors have been encountered based upon the results of the interleaved data analysis.

2. (Original) The method of claim 1 further comprising the production of a reference status byte in response to the analysis step, the reference status byte including an amplitude bit and a shape bit to indicate compliance with the predetermined amplitude condition and the predetermined shape condition, respectively for the analyzed reference field.

3. (Original) The method of claim 1 further comprising the analysis of the reference bytes to perform operating parameter updates for the data storage system.

4. (Original) The method of claim 3 wherein the operating parameter updates include adjustments to a readout system in the data storage system so that a read signal offset is optimized.

5. (Original) The method of claim 3 wherein the operating parameter updates include adjustments to a readout system in the data storage system so that a read signal gain is optimized.

6. (Original) The method of claim 3 wherein the operating parameter updates include adjustments to a synchronization system within the data storage system so that optimum phase synchronization can be achieved between a readout signal and a storage media synchronization signal.

7. (Original) The method of claim 5 wherein the read signal gain is optimized by adjusting the readout system to maximize the resolution of the readout window so that the reading of the defined data in the reference field will fill substantially all of the readout window.

8. (Original) The method of claim 4 wherein the read signal offset is optimized by adjusting the readout system to maximize the resolution of the readout window so that the reading of the defined data in the reference field will fill substantially all of the readout window.

9. (Original) The method of claim 2 further comprising predicting the existence in data retrieval errors in the read data on either side of the reference field based upon the reference status byte.

10. (Previously presented) The method of claim 1 wherein the data ~~is~~ stored on the storage media is analyzed as a virtual matrix to allow for further error correction operations, and wherein the reference fields are arranged as a plurality of columns within the virtual matrix.

11. (Original) The method of claim 10 further comprising the production of a reference status byte in response to the analysis step, the reference status byte including an amplitude bit and a shape bit to indicate compliance with the predetermined amplitude condition and the predetermined shape condition, respectively for the analyzed reference field.

12. (Previously presented) The method of claim 11 further comprising predicting the existence of data retrieval errors in the read data on either side of the reference field based upon the reference status byte.

13. (Previously presented) A method of continuously controlling a plurality of operating perimeters and providing error correction capabilities for a data storage system, the method comprising:

storing an interleaved data set which includes a plurality of reference bytes interleaved with information data, each reference byte including a defined data pattern and being placed at a predetermined location within the interleaved data set;

reading the information data and the interleaved reference bytes, and

based upon the defined data pattern of the reference bytes, adjusting operating parameters as necessary and performing error correction analysis.

14. (Previously presented) The method of claim 13 wherein the step of error correction analysis includes analyzing the retrieved reference bytes to determine if the retrieved reference bytes meets a predetermined shape condition and a predetermined amplitude condition; and predicting whether readout errors exist on either side of the reference byte based upon the results of the reference byte analysis.

15. (Previously presented) The method of claim 13 further comprising the production of a reference status byte in response to an analysis of the reference byte, the reference status byte including an amplitude bit and a shape bit to indicate compliance with the predetermined amplitude condition and the predetermined shape condition, respectively.

16. (Original) The method of claim 13 further comprising initializing the data storage device by reading an initialization data pattern and adjusting the readout system to maximize the resolution of the readout window so that the reading of the initialization data pattern will fill substantially all of the readout window.

17. (Previously presented) The method of claim 13 wherein the step of adjusting operating parameters involves adjusting a gain window of a readout amplifier so that the readout of the predetermined pattern will fill substantially all of the gain window.

18. (Previously presented) The method of claim 13 wherein the operating parameter is the read signal offset.

19. (Previously presented) The method of claim 13 wherein the operating parameter is the read signal gain.

20. (Previously presented) The method of claim 13 wherein the operating parameter is the phase synchronization of the data storage device read system.

21. (Previously presented) The method of claim 13 wherein the operating parameter is the frequency synchronization of the data storage device read system.

22. (Previously presented) A method of providing optimum read channel operation in a data storage device, the method comprising:

storing data on a storage media which includes periodic reference fields that are interleaved within information data, each reference field including a defined pattern; and

using the periodic reference fields to update a plurality of operating parameters of the read channel and to provide a reference field status byte indicative of possible errors that exist in the data.

23. (Original) The method of claim 22 wherein one of the plurality of operating parameter is a read signal gain, wherein the read signal gain is adjusted to an optimum level depending on the results of reading the reference fields.

24. (Original) The method of claim 22 wherein one of the plurality of operating parameter is a read signal offset, wherein the read signal offset is adjusted to an optimum level depending on the results of reading the reference fields.

25. (Original) The method of claim 22 wherein one of the plurality of operating parameter is a read signal phase synchronization, wherein a read clock signal is adjusted to an optimum level depending on the results of reading the reference fields.

26. (Original) The method of claim 22 wherein the reference field status byte is obtained by comparing the amplitude and shape of a readout from the reference field with an expected readout signal, and the reference field status byte is indicative of whether the readout from the reference field matches the expected readout signal.

27. (Original) The method of claim 26 wherein the reference field status byte includes a first bit indicative of whether the amplitude of the readout from the reference field matches the expected readout signal.

28. (Original) The method of claim 27 wherein the reference field status byte includes a second bit indicative of whether the shape of the readout from the reference field matches the expected readout signal.

29. (Original) The method of claim 22 further comprising the performance of an error correction methodology, wherein the reference field status byte is utilized by the error correction methodology to provide efficient error correction.

30. (Original) The method of claim 28 wherein the reference field status byte includes further bits indicative of the amplitude of the readout from the reference field.

31. (Original) The method of claim 23 wherein the read signal gain is adjusted to an optimum level which allows for effective signal conditioning.